Amendments to the Claims:

The following claims will replace all prior versions of the claims in this application (in the unlikely event that no claims follow herein, the previously pending claims will remain):

Listing of the Claims

1. (Original) A method for detecting a pupil for iris recognition, comprising the steps of:

a) detecting light sources in the pupil from an eye image as two reference points;

b) determining first boundary candidate points located between the iris and the pupil of the eye image, which cross over a straight line between the two reference points;

c) determining second boundary candidate points located between the iris and the pupil of the eye image, which cross over a perpendicular bisector of a straight line between the first boundary candidate points; and

d) determining a location and a size of the pupil by obtaining a radius of a circle and coordinates of a center of the circle based on a center candidate point, wherein the center candidate point is a center point of perpendicular bisectors of straight line between the neighbor boundary candidate points, to thereby detect the pupil.

2. (Original) The method as recited in claim 1, wherein said step a) includes the steps of:

a1) obtaining geometrical differences between light images on the eye image;

a2) calculating a mean value of the geometrical differences and modeling the geometrical differences as a Gaussian wave to generate templates; and

a3) matching the templates so that the reference points located in the pupil of the eye image are selected, to thereby detect two reference points.

3. (Original) The method as recited in claim 1, wherein said step b) includes the steps of:

b1) extracting a profile representing variation of pixels on a direction of X-axis based on the two reference points;

b2) generating a boundary candidate mask corresponding to a tilt and detecting two boundary candidates of the primary signal crossing the reference points on the X-axis; and

b3) generating a boundary candidate wave based on convolution of the profile and the boundary candidate mask, and selecting the boundary candidate points based on the boundary candidate wave.

4. (Original) The method as recited in claim 3, wherein in said step c), another boundary candidate points are determined on the perpendicular line of the center point bisecting the straight line between the first boundary candidate points as the same method as said step b).

5. (Currently amended) The method as recited in claim 1~~-or 4~~, wherein since the curvature of the pupil is different, a radius of the pupil is obtained by a magnified maximum coefficients algorithm, coordinates of the center point of the pupil are obtained by a bisecting algorithm, a distance between the center point and the radius of the pupil in counterclockwise is obtained, and a graph is illustrated in which x-axis denotes a rotation angle and y-axis denotes the radius of the pupil.

6. (Original) A method for extracting a shape descriptor for iris recognition, the method comprising the steps of:

a) extracting a feature of an iris under a scale-space and/or a scale illumination;

b) normalizing a low-order moment with a mean size and/or a mean illumination, to thereby generate a Zernike moment which is size-invariant and/or illumination-invariant, based on the low-order moment; and

c) extracting a shape descriptor which is rotation-invariant, size-invariant and/or illumination-invariant, based on the Zernike moment.

7. (Original) The method as recited in claim 6, further comprising the steps of:

establishing an indexed iris shape grouping database based on the shape descriptor; and

retrieving an indexed iris shape group based on an iris shape descriptor similar to that of a query image from the iris shape grouping database.

8. (Original) A method for extracting a shape descriptor for iris recognition, the method comprising the steps of:

a) extracting a skeleton from the iris;

b) thinning the skeleton, extracting straight lines by connecting pixels in the skeleton, obtaining a line list; and

c) normalizing the line list and setting the normalized line list as a shape descriptor.

9. (Original) The method as recited in claim 6, further comprising the steps of:

establishing a iris shape database of dissimilar shape descriptor by measuring dissimilarity of the images in an indexed similar iris shape group based on the shape descriptor; and

retrieving an iris shape matched to a query image from the iris shape database.

10. (Original) The method as recited in claim 9, wherein the step of retrieving an iris image includes the steps of:

comparing shape descriptors in the iris shape database and a shape descriptor of the query image;

measuring each distance between the shape descriptors in the iris shape database and the shape descriptor of the query image;

setting summation value of the minimum values of the distances as the dissimilarity values; and

selecting the image having a small value among the dissimilarity values as a similar image.

11. (Original) An apparatus for extracting a feature of an iris, comprising:

image capturing means for digitalizing and quantizing an image and obtaining an appropriate image for iris recognition;

a reference point detecting means for detecting reference points in a pupil from the image, and detecting an actual center point of the pupil;

boundary detecting means for detecting an inner boundary between the pupil and the iris and an outer boundary between the iris and a sclera, to thereby extract an iris image from the image;

image coordinates converting means for converting a coordinates of the iris image from a Cartesian coordinates system to a polar coordinates system, and defining the center point of the pupil as an origin point of the polar coordinates system;

image analysis region defining means for classifying analysis regions of the iris image in order to use an iris pattern as a feature point based on clinical experiences of the iridology;

image smoothing means for smoothing the image by performing a scale space filtering of the analysis region of the iris image in order to clearly distinguish a brightness distribution difference between neighboring pixels of the image;

image normalizing means for normalizing a low-order moment used for the smoothen image with a mean size; and

shape descriptor extracting means for generating a Zernike moment based on the feature point extracted in a scale space and a scale illumination, and extracting a shape descriptor which is rotation-invariant and noise-resistant by using Zernike moment.

12. (Original) The apparatus as recited in claim 11, further comprising:

reference value storing means for storing a reference value as a template by comparing a stability of the Zernike moment and a similarity of Euclid distance.

13. (Original) The apparatus as recited in claim 12, wherein in said reference value storing means, the Zernike moment, which is generated based on the feature point extracted under the scale space and the scale illumination, is stored as the reference value.

14. (Currently amended) The apparatus as recited in ~~one of claims 11 to 13~~ claim 11, wherein said image capturing means captures an eye image appropriate for the iris recognition through an image selection process having an eye blink detection, a pupil location detection, and distribution of vertical edge components, after digitalizing and quantizing the eye image.

15. (Original) The apparatus as recited in claim 14, wherein said reference point detecting means removes edge noise based on an edge enhancing diffusion (EED) algorithm using a diffusion filter, diffuses the iris image by performing a Gaussian

blurring, changing a threshold used for binalizing the iris image based on a magnified maximum coefficients algorithm, to thereby obtain an actual center point of the pupil.

16. (Original) The apparatus as recited in claim 15, wherein the EED algorithm performs much diffusion in the same direction with the edge and less diffusion in the vertical direction to the edge.

17. (Original) The apparatus as recited in claim 15, wherein said boundary detecting means detects a pupil by obtaining a pupil boundary between the pupil and the iris, a radius of the circle and coordinates of the center point of the pupil and determining the location and the size of the pupil, and detects an outer boundary between the iris and a sclera based on arcs which are not necessarily concentric with the pupil boundary.

18. (Original) The apparatus as recited in claim 15, wherein said boundary detecting means detects the pupil in real time by iteratively changing the threshold, obtains a radius of the pupil based on a magnified maximum coefficients algorithm because the curvature of the pupil is different, obtains coordinates of the center point of the pupil based on a bisecting algorithm, obtains a distance between the center point and the radius of the pupil in counterclockwise, and represents a graph is illustrated in which x-axis denotes a rotation angle and y-axis denotes the radius of the pupil, to thereby detect an accurate boundary.

19. (Original) The apparatus as recited in claim 14, wherein the analysis region includes the image except an eyelid, eyelashes or a predetermined part that is blocked off by mirror reflection from illumination, and

wherein the analysis region is subdivided into a sector 1 at right and left 6 degree based on the 12 clock direction, a sector 2 at 24 degrees, in the clock-wise, a sector 3 at 42 degree, a sector 4 at 9 degree, a sector 5 at 30 degree, a sector 6 at 42 degree, a sector 7 at 27 degree, a sector 8 at 36 degree, a sector 9 at 18 degree, a sector 10 at 39 degree, a sector 11 at 27 degree, a sector 12 at 24 degree and a sector 13 at 36 degree, the 13 sectors are subdivided into 4 circular regions based on the pupil, and each circular region is called as a sector 1-4, a sector 1-3, a sector 1-2, and a sector 1-1.

20. (Original) The apparatus as recited in claim 18, wherein said image smoothing means performs 1-order scale-space filtering that provides the same pattern regardless of the size of the iris pattern image by using a Gaussian cannel with respect to a one-dimensional iris pattern image of the same radiuses around the pupil, obtains an edge, which is a zero-crossing point, and extracts the iris features in two-dimensional by accumulating the edge by using an overlapped convolution window.

21. (Original) The apparatus as recited in claim 18, wherein said image normalizing means normalizes the moment into a mean size based on a low-order

moment in order to obtain a feature quantity, to thereby generate a Zernike moment which is rotation-invariant but sensitive to size and illumination of the image into a Zernike moment which is size-invariant, and normalizes the moment into the mean brightness, if a change in a local illumination is modeled into a scale illumination change, to thereby generate a Zernike moment which is illumination-invariant.

22. (Original) A system for recognizing an iris, comprising:

image capturing means for digitalizing and quantizing an image and obtaining an appropriate image for iris recognition;

reference point detecting means for detecting reference points in a pupil from the image, and detecting an actual center point of the pupil;

boundary detecting means for detecting an inner boundary between the pupil and the iris and an outer boundary between the iris and a sclera, to thereby extract an iris image from the image;

image coordinates converting means for converting a coordinates of the iris image from a Cartesian coordinates system to a polar coordinates system, and defining the center point of the pupil as an origin point of the polar coordinates system;

image analysis region defining means for classifying analysis regions of the iris image in order to use an iris pattern as a feature point based on clinical experiences of the iridology;

image smoothing means for smoothing the image by performing a scale space filtering of the analysis region of the iris image in order to clearly distinguish a brightness distribution difference between neighboring pixels of the image;
image normalizing means for normalizing a low-order moment used for the smoothen image as a mean size;
shape descriptor extracting means for generating a Zernike moment based on the feature point extracted in a scale space and a scale illumination, and extracting a shape descriptor which is rotation-invariant and noise-resistant by using Zernike moment;
reference value storing means for storing a reference value as a template by comparing a stability of the Zernike moment and a similarity of Euclid distance; and
verifying/authenticating means for verifying/authenticating the iris by matching the feature quantities between models each of which represent the stability and the similarity of the Zernike moment of the query iris image in statistical.

23. (Original) The system as recited in claim 22, wherein said verification means recognizes the iris based on a least square (LS) algorithm and a least media of square (LmedS) algorithm, to thereby recognize the iris rapidly and precisely.

24. (Original) The system as recited in claim 22, wherein said verifying/authenticating means performs filtering of the moment of the image based on the similarity and the stability used for probability object recognition and matches the stored reference value moment to a local-space in order to obtain an outlier,

wherein the outlier allows the system to confirm or disconfirm the identification of the person and evaluate confirm level of the decision,

wherein a recognition rate is obtained by discriminative factor (DF), the DF has a high recognition ability when a matching number of the input image and the right model is more than a matching number of the input image and the wrong model.

25. (Currently amended) The system as recited in ~~one of claims 22 to 24~~ <u>claim 22</u>, wherein in extraction of a shape descriptor,

an image appropriate for an iris recognition is obtained through a digital camera, reference points in the pupil are detected, a pupil boundary between the pupil and the iris is defined, and an outer boundary between the iris and a sclera is detected based on arcs which are not necessarily concentric with the pupil boundary;

1-order scale-space filtering, which provides the same pattern regardless of the size of the iris pattern image by using a Gaussian cannel with respect to a one-dimensional iris pattern image of the same radiuses around the pupil is performed, an edge, which is a zero-crossing point, is obtained, and the iris features in two-dimensional is extracted by accumulating the edge by using an overlapped convolution window;

the moment is normalized into a mean size based on a low-order moment in order to obtain a feature quantity, to thereby generate a Zernike moment which is rotation-invariant but sensitive to size and illumination of the image into a Zernike moment which is size-invariant, and the moment is normalized into a mean brightness, if a change in a

local illumination is modeled into a scale illumination change, to thereby generate a Zernike moment which is illumination-invariant.

26. (Original) A method for extracting a feature of an iris, comprising the steps of:

a) digitalizing and quantizing an image and obtaining an appropriate image for iris recognition;

b) detecting reference points in a pupil from the image, and detecting an actual center point of the pupil;

c) detecting an inner boundary between the pupil and the iris and an outer boundary between the iris and a sclera, to thereby extract an iris image from the image;

d) converting a coordinates of the iris image from a Cartesian coordinates system to a polar coordinates system, and defining the center point of the pupil as an origin point of the polar coordinates system;

e) classifying analysis regions of the iris image in order to use an iris pattern as a feature point based on clinical experiences of the iridology;

f) smoothing the image by performing a scale space filtering of the analysis region of the iris image in order to clearly distinguish a brightness distribution difference between neighboring pixels of the image;

g) normalizing a low-order moment used for the smoothen image as a mean size; and

h) generating a Zernike moment based on the feature point extracted in a scale space and a scale illumination, and extracting a shape descriptor which is rotation-invariant and noise-resistant by using Zernike moment.

27. (Original) The method as recited in claim 26, further comprising the step of:
i) storing a reference value as a template by comparing a stability of the Zernike moment and a similarity of Euclid distance.

28. (Currently amended) The method as recited in claim 26~~ or 27~~, wherein the analysis region includes the image except an eyelid, eyelashes or a predetermined part that is blocked off by mirror reflection from illumination, and
wherein the analysis region is subdivided into a sector 1 at right and left 6 degree based on the 12 clock direction, a sector 2 at 24 degrees, in the clock-wise, a sector 3 at 42 degree, a sector 4 at 9 degree, a sector 5 at 30 degree, a sector 6 at 42 degree, a sector 7 at 27 degree, a sector 8 at 36 degree, a sector 9 at 18 degree, a sector 10 at 39 degree, a sector 11 at 27 degree, a sector 12 at 24 degree and a sector 13 at 36 degree, the 13 sectors are subdivided into 4 circular regions based on the pupil, and each circular region called as a sector 1-4, a sector 1-3, a sector 1-2 and a sector 1-1.

29. (Currently amended) The method as recited in claim 26~~ or 27~~, wherein in said step a), an eye image appropriate for the iris recognition is captured through an image selection process having an eye blink detection, a pupil location detection, and distribution of vertical edge components, after digitalizing and quantizing the eye image.

30. (Original) The method as recited in claim 29, wherein said step b) includes the steps of:

removing edge noise based on an edge enhancing diffusion (EED) algorithm using a diffusion filter;

diffusing the iris image by performing a Gaussian blurring; and

changing a threshold used for binalizing the iris image based on a magnified maximum coefficients algorithm, to thereby obtain an actual center point of the pupil.

31. (Original) The method as recited in claim 30, wherein the EED algorithm performs much diffusion in the same direction with the edge and smaller diffusion in the vertical direction to the edge.

32. (Original) The method as recited in claim 29, wherein said step d) includes steps of:

detecting a pupil by obtaining a pupil boundary between the pupil and the iris, a radius of the circle and coordinates of the center point of the pupil and determining the location and the size of the pupil; and

detecting an outer boundary between the iris and a sclera based on arcs which are not necessarily concentric with the pupil boundary,

wherein the pupil is detected in real time iteratively changing the threshold, since the curvature of the pupil is different, a radius of the pupil is obtained by a magnified maximum coefficients algorithm, coordinates of the center point of the pupil are

obtained by a bisecting algorithm, a distance between the center point and the radius of the pupil in counterclockwise is obtained, and a graph is illustrated in which x-axis denotes a rotation angle and y-axis denotes the radius of the pupil, to thereby detect an accurate boundary.

33. (Original) The method as recited in claim 32, wherein said step e) includes the steps of:

performing 1-order scale-space filtering that provides the same pattern regardless of the size of the iris pattern image by using a Gaussian cannel with respect to a one-dimensional iris pattern image of the same radiuses around the pupil;

obtaining an edge, which is a zero-crossing point; and

extracting the iris features in two-dimensional by accumulating the edge by using an overlapped convolution window,

wherein the size of data is reduced during the generation of an iris code.

34. (Original) The method as recited in claim 33, wherein in said step f), the moment is normalized into a mean size based on a low-order moment in order to obtain a feature quantity, to thereby generate a Zernike moment which is rotation-invariant but sensitive to size and illumination of the image into a Zernike moment which is size-invariant, and the moment is normalized into a mean brightness, if a change in a local illumination is modeled into a scale illumination change, to thereby generate a Zernike moment which is illumination-invariant.

35. (Original) A method for recognizing an iris, comprising the steps of:

a) digitalizing and quantizing an image and obtaining an appropriate image for iris recognition;

b) detecting reference points in a pupil from the image, and detecting an actual center point of the pupil;

c) detecting an inner boundary between the pupil and the iris and an outer boundary between the iris and a sclera, to thereby extract an iris image from the image;

d) converting a coordinates of the iris image from a Cartesian coordinates system to a polar coordinates system, and defining the center point of the pupil as an origin point of the polar coordinates system;

e) classifying analysis regions of the iris image in order to use an iris pattern as a feature point based on clinical experiences of the iridology;

f) smoothing the image by performing a scale space filtering of the analysis region of the iris image in order to clearly distinguish a brightness distribution difference between neighboring pixels of the image;

g) normalizing a low-order moment used for the smoothen image as a mean size;

h) generating a Zernike moment based on the feature point extracted in a scale space and a scale illumination, and extracting a shape descriptor which is rotation-invariant and noise-resistant by using Zernike moment;

i) storing a reference value as a template by comparing a stability of the Zernike moment and a similarity of Euclid distance; and

j) verifying/authenticating the iris by matching the feature quantities between models each of which represent the stability and the similarity of the Zernike moment of the query iris image in statistical.

36. (Original) The method as recited in claim 35, wherein said verification means recognizes the iris based on a least square (LS) algorithm and a least media of square (LmedS) algorithm, to thereby recognize the iris rapidly and precisely,
wherein filtering of the moment of the image is performed based on the similarity and the stability used for probability object recognition and matches the stored reference value moment to a local-space in order to obtain an outlier,
wherein the outlier allows the system to confirm or disconfirm the identification of the person and evaluate confirm level of the decision,
wherein a recognition rate is obtained by discriminative factor (DF), the DF has a high recognition ability when a matching number of the input image and the right model is more than a matching number of the input image and the wrong model.

37. (Original) A computer readable recording medium storing program for executing a method for detecting a pupil for iris recognition, the method comprising the steps of:
a) detecting light sources in the pupil from an eye image as two reference points;
b) determining first boundary candidate points located between the iris and the pupil of the eye image, which cross over a straight line between the two reference points;

c) determining second boundary candidate points located between the iris and the pupil of the eye image, which cross over a perpendicular bisector of a straight line between the first boundary candidate points; and

d) determining a location and a size of the pupil by obtaining a radius of a circle and coordinates of a center of the circle based on a center candidate point, wherein the center candidate point is a center point of perpendicular bisectors of straight line between the neighbor boundary candidate points, to thereby detect the pupil.

38. (Original) A computer readable recording medium storing program for executing a method for extracting a shape descriptor for iris recognition, the method comprising the steps of:

a) extracting a feature of an iris under a scale-space and/or a scale illumination;

b) normalizing a low-order moment with a mean size and/or a mean illumination, to thereby generate a Zernike moment which is size-invariant and/or illumination-invariant, based on the low-order moment; and

c) extracting a shape descriptor which is rotation-invariant, size-invariant and/or illumination-invariant, based on the Zernike moment.

39. (Original) The computer readable recording medium as recited in claim 38, the method further comprising the steps of:

establishing an indexed iris shape grouping database based on the shape descriptor; and

retrieving an indexed iris shape group based on an iris shape descriptor similar to that of a query image from the indexed iris shape grouping database.

40. (Original) A computer readable recording medium storing program for executing a method for extracting a feature of an iris, the method comprising the steps of:

a) digitalizing and quantizing an image and obtaining an appropriate image for iris recognition;

b) detecting reference points in a pupil from the image, and detecting an actual center point of the pupil;

c) detecting an inner boundary between the pupil and the iris and an outer boundary between the iris and a sclera, to thereby extract an iris image from the image;

d) converting a coordinates of the iris image from a Cartesian coordinates system to a polar coordinates system, and defining the center point of the pupil as an origin point of the polar coordinates system;

e) classifying analysis regions of the iris image in order to use an iris pattern as a feature point based on clinical experiences of the iridology;

f) smoothing the image by performing a scale space filtering of the analysis region of the iris image in order to clearly distinguish a brightness distribution difference between neighboring pixels of the image;

g) normalizing a low-order moment used for the smoothen image as a mean size; and

h) generating a Zernike moment based on the feature point extracted in a scale space and a scale illumination, and extracting a shape descriptor which is rotation-invariant and noise-resistant by using Zernike moment.

41. (Original) The computer readable recording medium as recited in claim 40, the method further comprising the step of:

i) storing a reference value as a template by comparing a stability of the Zernike moment and a similarity of Euclid distance.

42. (Original) A computer readable recording medium storing program for executing a method for recognizing an iris, the method comprising the steps of:

a) digitalizing and quantizing an image and obtaining an appropriate image for iris recognition;

b) detecting reference points in a pupil from the image, and detecting an actual center point of the pupil;

c) detecting an inner boundary between the pupil and the iris and an outer boundary between the iris and a sclera, to thereby extract an iris image from the image;

d) converting a coordinates of the iris image from a Cartesian coordinates system to a polar coordinates system, and defining the center point of the pupil as an origin point of the polar coordinates system;

e) classifying analysis regions of the iris image in order to use an iris pattern as a feature point based on clinical experiences of the iridology;

f) smoothing the image by performing a scale space filtering of the analysis region of the iris image in order to clearly distinguish a brightness distribution difference between neighboring pixels of the image;

g) normalizing a low-order moment used for the smoothen image as a mean size;

h) generating a Zernike moment based on the feature point extracted in a scale space and a scale illumination, and extracting a shape descriptor which is rotation-invariant and noise-resistant by using Zernike moment;

i) storing a reference value as a template by comparing a stability of the Zernike moment and a similarity of Euclid distance; and

j) verifying/authenticating the iris by matching the feature quantities between models each of which represent the stability and the similarity of the Zernike moment of the query iris image in statistical.

43. (New) The method as recited in claim 4, wherein since the curvature of the pupil is different, a radius of the pupil is obtained by a magnified maximum coefficients algorithm, coordinates of the center point of the pupil are obtained by a bisecting algorithm, a distance between the center point and the radius of the pupil in counterclockwise is obtained, and a graph is illustrated in which x-axis denotes a rotation angle and y-axis denotes the radius of the pupil.

44. (New) The apparatus as recited in claim 12, wherein said image capturing means captures an eye image appropriate for the iris recognition through an image

selection process having an eye blink detection, a pupil location detection, and distribution of vertical edge components, after digitalizing and quantizing the eye image.

45. (New) The apparatus as recited in claim 13, wherein said image capturing means captures an eye image appropriate for the iris recognition through an image selection process having an eye blink detection, a pupil location detection, and distribution of vertical edge components, after digitalizing and quantizing the eye image.

46. (New) The system as recited claim 23, wherein in extraction of a shape descriptor,

an image appropriate for an iris recognition is obtained through a digital camera, reference points in the pupil are detected, a pupil boundary between the pupil and the iris is defined, and an outer boundary between the iris and a sclera is detected based on arcs which are not necessarily concentric with the pupil boundary;

1-order scale-space filtering, which provides the same pattern regardless of the size of the iris pattern image by using a Gaussian cannel with respect to a one-dimensional iris pattern image of the same radiuses around the pupil is performed, an edge, which is a zero-crossing point, is obtained, and the iris features in two-dimensional is extracted by accumulating the edge by using an overlapped convolution window;

the moment is normalized into a mean size based on a low-order moment in order to obtain a feature quantity, to thereby generate a Zernike moment which is rotation-invariant but sensitive to size and illumination of the image into a Zernike moment which

is size-invariant, and the moment is normalized into a mean brightness, if a change in a local illumination is modeled into a scale illumination change, to thereby generate a Zernike moment which is illumination-invariant.

47. (New) The system as recited claim 24, wherein in extraction of a shape descriptor,

an image appropriate for an iris recognition is obtained through a digital camera, reference points in the pupil are detected, a pupil boundary between the pupil and the iris is defined, and an outer boundary between the iris and a sclera is detected based on arcs which are not necessarily concentric with the pupil boundary;

1-order scale-space filtering, which provides the same pattern regardless of the size of the iris pattern image by using a Gaussian cannel with respect to a one-dimensional iris pattern image of the same radiuses around the pupil is performed, an edge, which is a zero-crossing point, is obtained, and the iris features in two-dimensional is extracted by accumulating the edge by using an overlapped convolution window;

the moment is normalized into a mean size based on a low-order moment in order to obtain a feature quantity, to thereby generate a Zernike moment which is rotation-invariant but sensitive to size and illumination of the image into a Zernike moment which is size-invariant, and the moment is normalized into a mean brightness, if a change in a local illumination is modeled into a scale illumination change, to thereby generate a Zernike moment which is illumination-invariant.

48. (New) The method as recited in claim 27, wherein the analysis region includes the image except an eyelid, eyelashes or a predetermined part that is blocked off by mirror reflection from illumination, and

wherein the analysis region is subdivided into a sector 1 at right and left 6 degree based on the 12 clock direction, a sector 2 at 24 degrees, in the clock-wise, a sector 3 at 42 degree, a sector 4 at 9 degree, a sector 5 at 30 degree, a sector 6 at 42 degree, a sector 7 at 27 degree, a sector 8 at 36 degree, a sector 9 at 18 degree, a sector 10 at 39 degree, a sector 11 at 27 degree, a sector 12 at 24 degree and a sector 13 at 36 degree, the 13 sectors are subdivided into 4 circular regions based on the pupil, and each circular region called as a sector 1-4, a sector 1-3, a sector 1-2 and a sector 1-1.

49. (New) The method as recited in claim 27, wherein in said step a), an eye image appropriate for the iris recognition is captured through an image selection process having an eye blink detection, a pupil location detection, and distribution of vertical edge components, after digitalizing and quantizing the eye image.